Streamlined Biodiversity Development Assessment Report

Brewongle Solar Farm

Prepared for: Edify Energy Pty Ltd (Edify) C/O Kleinfelder Australia Pty Ltd - **Rob Townsend -** Senior NSW Team Leader

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Date: 17/04/2025

Project no: ER189

Document Control

Version - date	Purpose	Authors	Reviewer	Approved by
V1 – 19/12/2024	Draft for Client review	Toneya Smith Lucy Dunton	Brea Heidke	Arne Bishop
V2 - 24/01/2025	Final for Client issue	Toneya Smith Lucy Dunton, Brea Heidke	Patrick McEvoy	Arne Bishop
V3 – 31/01/2025	Final for Client issue	Toneya Smith Lucy Dunton, Brea Heidke	Arne Bishop	Arne Bishop
V4 – 17/04/2025	Final with updated credit report and sign off	Toneya Smith Lucy Dunton, Brea Heidke	Arne Bishop	Arne Bishop

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Declarations

Certification under clause 6.15 *Biodiversity Conservation Act 2016*.

I Arne Bishop certify that this report has been prepared based on the requirements of, and information provided under, the Biodiversity Assessment Method and clause 6.15 of the Biodiversity Conservation Act 2016 (BC Act).

Signature:_____
Date: 17/04/2025_____
BAM Assessor Accreditation no: BAAS 17065

This S-BDAR has been prepared to meet the requirements of BAM 2020. **Appendix A** provides an assessment of compliance with the minimum information requirements outlined in BAM Appendix K.

Conflicts of interest.

I Arne Bishop declare that I have considered the circumstances and there is no actual, perceived or potential conflict of interest.

Signature: _____
Date: 17/04/2025_____
BAM Assessor Accreditation no: BAAS 17065

Abbreviations

Term	Description
Assessment Area	Includes the Subject Land and a 1,500 m buffer around the Subject Land
BAM	Biodiversity Assessment Method
BAM-C	Biodiversity Assessment Method Calculator
BC Act	*Biodiversity Conservation Act 2016 (NSW)*
BDAR	Biodiversity Development Assessment Report
S-BDAR	Streamlined Biodiversity Assessment Report
BMP	Biodiversity management Plan
Biodiversity offsets	Actions taken to counterbalance the remaining negative effects of activities, such as land clearing for development. These offsets involve conserving and managing biodiversity in one location to make up for the biodiversity losses in another area.
BOM	Bureau of Meteorology
BOS	Biodiversity Offsets Scheme
CEEC	Critically endangered ecological community
DBH	Diameter at breast height over bark
DCCEEW (NSW)	NSW Department of Climate Change, Energy, the Environment and Water
DCCEEW (Cth)	Commonwealth Department of Climate Change, Energy, the Environment and Water (
DPIE	Former Department of Planning, Industry and Environment. Now replaced by DPHI & DCCEEW (NSW)
DNG	Derived native grassland
Ecosystem credit	This involves assessing the value of EECs, CEECs, and threatened species habitats for species likely to be found within PCT. Ecosystem credits quantify the reduction in biodiversity at a development site and the corresponding increase in biodiversity at a conservation site.
EEC	Endangered ecological community
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
GIS	Geographic information system
GPS	Global positioning system
ha	Hectare
HTW	High threat weed
IBRA	Interim Biogeographic Regionalisation for Australia
LGA	Local government area
LLS Act	*Local Land Services Act 2013* (NSW)
Locality	The area within a 10km radius from the Subject Land.
Koala SAT plot	Koala Spot Assessment Technique
KFH	Key Fish Habitat
MNES	Matters of national environmental significance

Term	Description
NVR map	Native Vegetation Regulatory Map

Details and experience of author(s) and contributors

Name	BAM Assessor Accreditation no.	Position/Role	Tasks performed	Relevant qualifications
Arne Bishop	BAAS 17065	Director Accredited Assessor	BAM-C data entry and analysis, document review	Bachelor of Environmental Science.
Patrick McEvoy	BAAS 20018	Senior Ecologist/ Accredited Assessor	Report review	Master of Research. Bachelor of Environmental Science & Management.
Brea Heidke	BAAS 24058	Ecologist/ Team Lead	Field surveys, data management and report preparation	Master of Environmental Management. Bachelor of Environmental Science and Management.
Toneya Smith	-	Field Ecologist	Field surveys, data management and report preparation	Bachelor of Science (Marine Systems).
Julian Carson	-	Ecologist	Field surveys	Bachelor of Environmental Science & Management.
Bryce Dedal	-	Field Ecologist	Field surveys	Diploma of Conservation Land Management.
Lucy Dunton	-	Field Ecologist	Report preparation	Bachelor of Science (Environmental Science).

Executive summary

The Brewongle Solar Farm development involves the construction, operation, and decommissioning of approximately 192,000 solar panels and associated infrastructure, including a substation, transmission line connection, and a Battery Energy Storage System. The project will involve modifying up to 151.3 hectares of vegetation, including 0.48 hectares of PCT 3376 – Southern Tableland Grassy Box Woodland (Figure 3). This vegetation is considered to be commensurate with the BC Act listed community White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner, and Riverina Bioregions. However, it is not considered to be commensurate with the equivalent EPBC Act listing because its patch size and condition are below the relevant thresholds. Its condition (Vegetation Integrity Score (VIS) = 6.7) is well below the threshold requiring offsets (≥ 15 for EECs); consequently, there is no ecosystem credit offset liability required.

This assessment was conducted according to the streamlined module for small areas of the Biodiversity Assessment Method (BAM) 2020. Under this module, threatened species that are not considered at risk of Serious and Irreversible Impacts (SAII species) and that are not recorded incidentally within the Subject Land do not require specific assessment. Five SAII species were considered likely to occur within the Subject Land, and targeted surveys were undertaken. However, no threatened species or SAII listed species were detected on the Subject Land, and no species offsets are required.

The recommended mitigation measures will manage the minor identified impacts to native biodiversity relating to the proposed activity on the subject and adjacent land.

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1 Introduction

1.1 Overview

EcoResolve Environment & Design (EcoResolve) have been commissioned by Edify Energy Pty Ltd (Edify), C/O Kleinfelder Australia Pty Ltd, to prepare a streamlined Biodiversity Development Assessment Report (S-BDAR) in accordance with the *Biodiversity Assessment Method Order 2020* (State of NSW and Department of Planning, Industry and Environment, 2020) (BAM-O), and to address more broadly the requirements in the *NSW Biodiversity Conservation Act 2016* (BC Act). This report aims to address Section 6.12 of the BC Act which states "For the purposes of the biodiversity offsets scheme, a biodiversity development assessment report is a report prepared by an accredited person in relation to proposed development or activity that would be authorised by a planning approval, or proposed clearing that would be authorised by a vegetation clearing approval, that—

a) assesses in accordance with the biodiversity assessment method the biodiversity values of the land subject to the proposed development, activity or clearing, and
b) assesses in accordance with that method the impact of proposed development, activity or clearing on the biodiversity values of that land, and
c) sets out the measures that the proponent of the proposed development, activity or clearing proposes to take to avoid or minimise the impact of the proposed development, activity or clearing, and
d) specifies in accordance with that method the number and class of biodiversity credits that are required to be retired to offset the residual impacts on biodiversity values of the actions to which the biodiversity offsets scheme applies."

1.2 Background

This S-BDAR has been prepared in association of the proposed development under Part 4 of the *NSW Environmental Planning and Assessment Act 1979* (EP&A Act) for the development of the Brewongle Solar Farm. The NSW *Biodiversity Conservation Act 2016* (BC Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) also apply. The Subject Land is located at 315 Tarana Road, Brewongle (hereafter referred to as the Project site). The *Biodiversity Conservation Regulation 2017* (BC Reg) requires the application of the Biodiversity Assessment Method 2020 (BAM). A streamlined BDAR has been conducted in accordance with the BAM because the proposed clearing of 0.48 hectares of native vegetation is below the 2-hectare area clearing threshold for the minimum lot size of 100 ha within the Subject Land locality. Consequently, this S-BDAR has been prepared in accordance with the small areas streamlined assessment module in Appendix C of the BAM.

EcoResolve has been commissioned to assess the biodiversity impacts of the Project. The first stage of the assessment, a Preliminary Ecological Assessment (PEA) of the Subject Land, was completed in August 2023 by Kleinfelder Australia Pty Ltd (**Appendix F**). As access was permitted across the entire property, EcoResolve ecologists deemed it prudent to conduct surveys across this broader area identified in the S-BDAR as the Study Area to better identify vegetation zones and assess fauna presence within the adjoining habitat. A site visit conducted by EcoResolve ecologists Brea Heidke and Toneya Smith on 5 February 2024, identified approximately 0.48 hectares of planted native vegetation within the project area, which aligns with Plant Community Type (PCT) 3376. This vegetation is

considered to be commensurate with the BC Act listed community *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions* (**Figure 4**). However, it is not considered to be commensurate with the EPBC Act listed community, *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland*, as it does not reach the minimum patch size and condition thresholds.

1.3 The Site

The proposed development site is located approximately 12 kilometres south-east of Bathurst at 315 Tarana Road, Brewongle NSW. It also includes two small sections of road side widening: one is on the entering lane of the T-intersection from O'Connell Road into Tarana Road, and the other is opposite the proposed access track on 315 Tarana Road. This portion of The Subject Land is located within the road corridor. The Subject Land located at 315 Tarana Road is zoned as RU1 Primary Production and currently managed for agricultural purposes, including grazing and cropping. The minimum lot size for development purposes is 100 hectares.

The Subject Land occupies three lots / part lots

- Lot 1 DP1206130
- Lot 1 DP1236901
- Lot 2 DP1236901
- Lot 126 DP755784
- Lot 127 DP755784

These lots, including a 1,500-meter buffer make up the Study Area (**Figure 2**). The Study Area includes the entire property at 315 Tarana Road, Brewongle, which contains the Subject Land **(Figure 1**). The Study Area includes the access tracks on Tarana Road, as well as Saltwater Creek, a potential receiving environment which contains high biodiversity value (Biodiversity Values Mapping) and forms potential habitat for threatened fauna recorded in the locality. Other water features of relevance in the Study Area include ten dams / waterbodies that exist on the property. The Subject Land, however, encompasses three of these ephemeral water features, which have been designated as restricted areas that will not be modified by the proposed action. The Study Area lies over a predominantly granite geology and associated landforms.

A thin band of structural vegetation in the south-western corner of Lot 1 DP1236901 has been classified by DPE's State Vegetation Type Mapping (SVTM) as Southern Tableland Grassy Box Woodland (PCT 3376). This PCT is associated to the NSW and the Commonwealth Critically Endangered Ecological Community (CEEC) *White Box Blakely's Red Gum Woodland*.

1.4 The Project

Edify Energy Pty Ltd is investigating future development options for a hybrid solar farm and battery energy storage system within the Subject Land. The Project aims to provide a new and dispatchable source of carbon-free electricity for NSW, with construction anticipated to commence in 2026, subject to necessary approvals. It is designed to achieve a generation capacity of 90 megawatts (MW) of alternating current (AC), supported by an on-site battery energy storage system with a capacity of up

to 90MW/180MWh. Key infrastructure components include solar panel arrays, inverters, transformers, overhead lines, underground cabling, an integrated battery storage system, a site office and maintenance building, access tracks, road and electrical easement crossings, perimeter security fencing, and a substation to facilitate connection to Transgrid's existing 132kV transmission line. The Project has been deemed a State Significant Development (SSD).

The Project will involve modifying up to 151.3 hectares of predominantly non-native vegetation.

1.5 Sources of Information

The information sources consulted during this assessment include:

- BAM 2020.
- BAM Stage 1 and Stage 2 Operational Manuals.
- BioNet Threatened Biodiversity Data Collection (TBDC).
- BioNet Vegetation Identification System.
- IBRA regional and subregional mapping.
- Mitchell Landscapes mapping and associated literature.
- Latest available high-resolution imagery.
- Available drainage and wetland mapping.
- Regional vegetation mapping from the NSW State Vegetation Type Map to identify PCTs that may be occurring within the Subject Land.
- A review of existing vegetation mapping, habitat mapping and reports of relevance to the Subject Land and surrounding locality (e.g., 10 kilometres).
- Database searches to identify records of the threatened entities and Matters of National Environmental Significance (MNES) that may occur within 20 kilometres of the Subject Land, including:
- NSW Government BioNET Atlas database.
- Department of the Environment (DoE) Protected Matters Search Tool.
- A Likelihood of Occurrence (LoO) analysis for all threatened species and communities identified through desktop research.

1.6 Category 1 Land Consideration

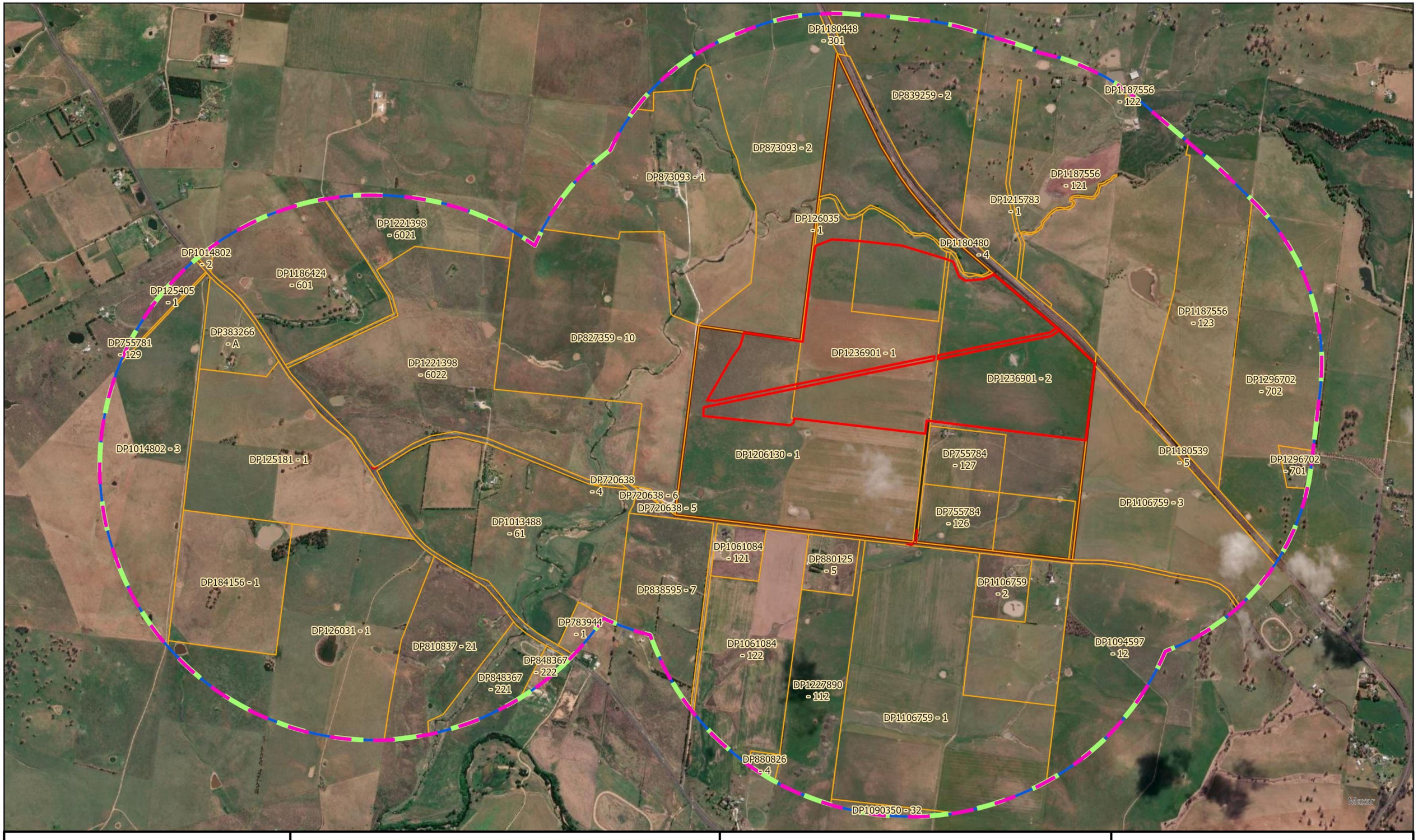
Land category definitions are found under the LLS Act 2013 and mapped on the draft Native Vegetation Regulatory Map (NVR map), which highlight the legislative framework for the clearing of native vegetation in rural areas. The draft NVR Map is in a transitional arrangement, during which landowners are responsible for determining the categorisation of their land in accordance with section 60F of the LLS Act. Category 1- exempt land (Cat 1 Land) is defined under the LLS Act (Part 5A Division 2 Section 60H). Land is to be designated as Cat 1 land if the Environment Agency Head reasonably believes that:

- the land was cleared of native vegetation as of 1 January 1990, or
- the land was lawfully cleared of native vegetation between 1 January 1990 and the commencement of this Part.
- Land is to be designated as Category 1-exempt land if the Environment Agency Head reasonably believes that:

- the land contains low conservation value grasslands, or
- the land contains native vegetation that was identified as regrowth in a property vegetation plan referred to in Section 9 (2) (b) of the Native Vegetation Act 2003, or
- the land is of a kind prescribed by the regulations as Category 1-exempt land.

In the context of this S-BDAR, consideration of Cat 1 exempt lands (LLS Act 2013) for the part of the Subject Land that is mapped on the draft NVR Map. Generally, to be declared 'Category 1 land' the areas are typically exotic grassland, and they're exempt from requiring development approval if they're validated to be commensurate with the definition. However, to be commensurate with the definition, the land would presumably have a Vegetation Integrity Score (VIS) of less than 17 for a non-Threatened Ecological Community (TEC) and less than 15 for a TEC which would result in there being no offset requirement for Ecosystem Credits. Furthermore, declaration of land as Category 1 Lands, does not negate the need to consider prescribed impacts such as habitat for species credit species. As such, consultation with the Biodiversity, Conservation and Science (BCS) Group was taken to ascertain the appropriate implementation of vegetation mapping across the Subject Land (email correspondence received 13/11/2024). This consultation determined that the implementation of BAM methodology plots provided sufficient floristic evidence to ascertain land categorisation method within the Subject Land.

There is also a small area of Category 2- Sensitive Regulated land mapped that has been confirmed to be consistent with a degraded patch (~0.48 ha) of the Biodiversity Conservation Act 2016 (BC Act) listed Critically Endangered Ecological Community (CEEC) White Box Yellow Box Blakely's Red Gum Woodland (BGW), shown in **Figure 3 (Appendix D)**. CEECs are designated as Category 2- Sensitive Regulated land (clause 108(2)(b), Local Land Services Regulation 2014 (LLS Regulation)).



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Author: BH | Version: C-A3 | Date: 16/01/2025

Figure 1: Site Map

Location: Brewongle, NSW
Purpose: Streamlined BDRA
Client: Edify Energy Pty Ltd (Edify) C/O Kleinfelder Australia Pty Ltd
Reference: ER189

Legend

- Subject Land
- 1,500m Subject Land Buffer

IBRA subregion
- Bathurst

IBRA Region
- South Eastern Highlands
- Cadastral lot boundaries
- Study Area
- Proposed Site Access Road

0.20.1 0 0.2 0.4 0.6 0.8 Kilometers

N

Spatial Reference
Datum: GDA2020
Projection: Transverse Mercator
Scale: 1:19,000

2 Landscape context

The assessment area includes the Subject Land and the area of land within a 1,500-metre buffer zone surrounding it (**Figure 2**). A summary of relevant landscape features identified within the assessment area is detailed in **Table 1**.

TABLE 1 LANDSCAPE ASSESSMENT OF THE SUBJECT LAND

Landscape	Assessment area
IBRA region	Southern Eastern Highlands (SEH11)
Rivers, streams, estuaries and wetlands	Yes – Saltwater Creek, a first order stream which runs underneath the Main Western Railway at the Northern border of the Subject Land. The creek borders the assessment area, however, does not overlap. Saltwater Creek holds important biodiversity values according to the Biodiversity Values Map (BVM).
Habitat connectivity	The vegetation within the broader Study Area is loosely connected via Saltwater Creek.
Karst, caves, crevices, cliffs, rocks or other geological features of significance	None present
Areas of outstanding biodiversity value	No listed AOBVs occur within the assessment area.
Mitchell Landscape	Bathurst Granites
Native vegetation cover	1.42%

SALT WATER CREEK 1

Mitchell Landscapes of New South Wales - Bioregional and Landscape Mapping. Spatial data retrieved via the SEED Portal.

Interim Biogeographic Regionalisation for Australia (IBRA), Version 7 Regions. Spatial data provided by the Department of Climate Change, Energy, the Environment and Water (DCCEEW). Available at: https://www.dcceew.gov.au

NSW Department of Planning and Environment (DPE). (2024). Biodiversity Values Map and Threshold Tool. Available at: https://www.environment.nsw.gov.au

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Author: BH | Version: C-A3 | Date: 16/01/2025

Figure 2: Location Map

Location: Brewongle, NSW
Purpose: Streamlined BDAR
Client: Edify Energy Pty Ltd (Edify) C/O Kleinfelder Australia Pty Ltd
Reference: ER189

Legend

- Creeks and Drainage Lines
- Farm Dam Area
- NSW Biodiversity Values Map
- 1,500m Subject Land buffer
- South Eastern Highlands

IBRA Subregion

- Bathurst
- Proposed Site Access Road
- Subject Land
- Study Area

NSW (Mitchell) landscape

- Bathurst Granites
- Upper Macquarie Channels and Floodplains

0 0.2 0.4 0.8 Kilometers

N

Spatial Reference
Datum: GDA2020
Projection: Transverse Mercator
Scale: 1:19,000

3 Native Vegetation

This section addresses the requirements set out in Sections 4.1–4.4 of the BAM in assessing native vegetation, threatened ecological communities and vegetation integrity (Chapter 4, DPIE, 2020). The identification and mapping of all PCTs and TECs on the Subject Land have been in categorised according to the NSW PCT classification as described in the BioNet Vegetation Information System.

3.1 Plot-based vegetation surveys

As part of the Preliminary Ecological Assessment (PEA) (August 2023), the native vegetation within the Subject Land was identified as PCT 3376, which is commensurate with *the Biodiversity Conservation Act 2016* (BC Act) listed community *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions* (**Figure 3**).

Further systematic field-based vegetation surveys were undertaken by EcoResolve in February 2024 to collect floristic data at the Study Area in accordance with Sections 4.1, 4.2 and Subsection 4.2.1 of the BAM (**Figure 3**). The surveys were designed to assess the expected environmental variation and address any areas with gaps in existing mapping and information. The survey effort followed guidelines set out in Table 3 of the BAM which states one vegetation integrity plot is required for vegetation zones <2 hectares in area. Preliminary vegetation assessments were undertaken on 7 February 2024 by means of Rapid Data Points (RDPs) to provide an overview of the vegetation condition across the Study Area. Subsequent to this, four BAM plots were placed throughout the Study Area to more comprehensively measure the Vegetation Integrity (VI) (i.e., composition, structure and functional components) of the Subject Lands' native vegetation cover. The BAM plots were placed in a location that was representative of the vegetation zone being assessed and beyond the prescribed minimum distance from ecotones, tracks and other areas of disturbance.

The plots included:

- One standard 20 x 20 metre plot, to assess the composition and structure attributes, including trees, shrubs, grasses, forbs, ferns and other growth forms.
- One standard 20 x 50 metre plot (1,000 metres^2) to assess the function attributes: number of large trees
  (i.e., > 50 centimetres DBH), stem size class, tree regeneration, length of fallen logs, high threat exotic vegetation cover and hollow-bearing trees.
- Five 1 m^2 sub-plots to assess average litter cover for the plots.

The vegetation community identified within the Subject Land occurred in low condition, and a vegetation zone was assigned accordingly. See **Appendix B** for vegetation survey data.

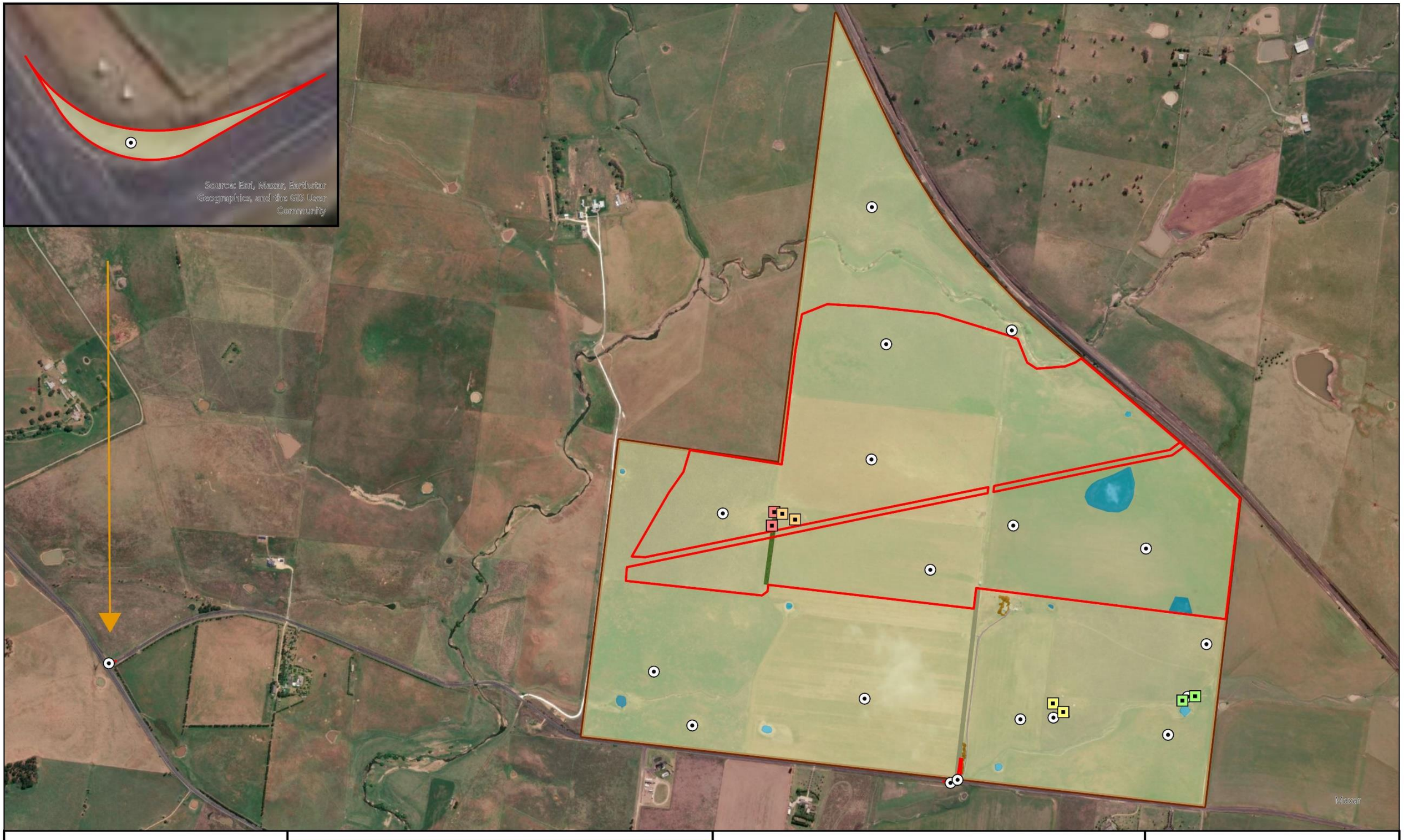

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Figure 3: Vegetation Zones

Location: Brewongle, NSW
Purpose: Streamlined BDAR
Client: Edify Energy Pty Ltd (Edify) C/O Kleinfelder Australia Pty Ltd
Reference: ER189

Legend

- Proposed Site Access Road
- Subject Land
- Study Area

BAM Plot

- BHTS1
- BHTS2
- BHTS3
- BHTS4
- RDP

Plant Community Type

- PCT 0
- Planted Non-native Vegetation
- PCT 3376 (Low)
- Man-made Dam
- Unsealed Access Track

N

0 100 200 300 400 Meters

Spatial Reference
Datum: GDA2020
Projection: Transverse Mercator

Scale: 1:12,000

3.2 Identification of Plant Community Types and Threatened Ecological Communities

The Project will involve modifying up to 151.3 hectares of vegetation on site of which approximately 0.48 hectares of degraded PCT 3376 – *Southern Tableland Grassy Box Woodland* (

Table 2). This vegetation is considered to be commensurate with the BC Act listed community *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions* (**Figure 4**). However, it is not considered to commensurate with the equivalent EPBC Act listed community, *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* because it does not reach the minimum patch size and condition class thresholds. **Appendix C** includes a list of the plant species that were identified during the field surveys.

TABLE 2 PCT IDENTIFICATION

Identification	Subject Land
PCT ID	3376
PCT name	Southern Tableland Grassy Box Woodland
Vegetation formation	Grassy woodlands
Vegetation class	Southern Tableland Grassy Woodlands
Per cent cleared value (%)	92.96%
Extent within Subject Land (ha)	0.48 ha

Figure 4: Threatened Ecological Communities

Legend

- Proposed Site Access Road
- Subject Land
- Study Area

BC Act Listed Community

- CE - White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions

Location: Brewongle, NSW
Purpose: Streamlined BDAR
Client: Edify Energy Pty Ltd C/O Kleinfelder Australia Pty Ltd
Reference: ER189

N

Scale: 1:1,500

Datum:	WGS 1984
Version:	C - A4
Date:	16/01/2025
Author:	BH
Reference:	ER189

0 0.02 0.04 Km

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3.3 Patch size

Patch size was calculated according to section 4.3.2 of the BAM 2020. Adjacent areas of planted native canopy trees were considered if there were no roads separating them from the native vegetation on the Subject Land. However, this is not the case with the Study Area or Subject Land; therefore, none were included. The patch size was confined to the isolated patch 0.48 ha of PCT 3376 with exotic grasslands and cropping surrounding the patch in all directions.

3.4 Calculation of current vegetation integrity

The plot-based vegetation survey data was entered into the BAM calculator to calculate the VI score of native vegetation on the Subject Land. The Project will remove 0.48 hectares of native vegetation (PCT 3376) from the Subject Land (**Figure 4**), represented by the reduction of the VI from 6.7 to 0. Changes in VI and composition, structure and function scores for the single vegetation zone are presented in **Table 3**.

TABLE 3 CHANGE IN VEGETATION INTEGRITY SCORE.

		Before development				After development				Change
Vegetation zone	Area (ha)	Composition	Structure	Function	VI score	Composition	Structure	Function	VI score	Change in VI score
3376_low	0.48	3.3	3.1	29.7	6.7	0	0	0	0	-6.7

Section 9.2.1 of the BAM establishes VI thresholds above which an offset for direct impacts to native vegetation are required (**Table 4**). As the native vegetation on the Subject Land is a TEC, the applicable threshold is a VI of ≥15. The VI of the native vegetation is 6.7, therefore, no ecosystem credit offset is required.

TABLE 4 THRESHOLDS FOR OFFSETTING DIRECT IMPACTS TO NATIVE VEGETATION (SECTION 9.2.1, BAM 2020).

Vegetation characteristics	VI threshold for offsetting
Where the PCT is representative of an EEC or a CEEC	≥15
Where the PCT is associated with threatened species habitat (as represented by ecosystem credits) or represents a vulnerable ecological community	≥17
Where the PCT does not represent a TEC and is not associated with threatened species habitat.	≥20

4 Threatened species

The streamlined assessment module for small areas allows assessors to only target SAII species and forego assessment of non-SAII threatened species if they have not been detected incidentally within the Subject Land. Therefore, only SAII species which may occur on the Subject Land have been assessed in this Streamlined BDAR using Steps 3–5 of Section 5.2 of the BAM. Six species at risk of SAII were identified as having some likelihood of occurring, these being.

- *Caladenia attenuata* (Duramana Fingers)
- *Litoria castanea* (Yellow-spotted Tree Frog)
- *Mixophyes balbus* (Stuttering Frog)

- *Tympanocryptis mccartneyi* (Bathurst Grassland Earless Dragon).
- *Miniopterus orianae oceanensis* (Large Bent-winged Bat)
- *Miniopterus australis* (Little -Bent-winged Bat)

The Subject Land does not lie within the areas of mapped important habitat for the two former species, and they were not considered further.

4.1 Field surveys

The investigation conducted when preparing the S-BDAR (EcoResolve, 2024) included incidental surveys of threatened candidate species identified in the 2023 Kleinfelder Preliminary Ecological Assessment (PEA). Targeted surveys were conducted on all SAII species. Field surveys consisted of the following

- Systematic field traverses (10m transects)
- Song meter and Anabat deployment
- Koala Spot Assessment Technique (SAT) plots
- Dawn and dusk bird surveys
- Spotlighting and call playback

No threatened species were detected during the site visits and bat and frog calls were from non-threatened species only. Error! Reference source not found. details the dates of each survey, the species targeted, the survey methods used and the results (**Figure 5**).

TABLE 5 TARGETED THREATENED SPECIES SURVEYS ON THE SUBJECT LAND

Threatened species surveys						
Survey method	**Species Targeted**	**SAII Species**	**Timing of survey**	**Effort (hours and no. people)**	**Species detections**	**Further assessment required (BAM Subsections 5.2.5 and 5.2.6)**
Threatened flora meanders (10 m transects)	*Caladenia attenuata* (Duramana Fingers)	YES	29/10/2024	~2 person hours 2 people	NO	NO
Anabat	*Miniopterus australis* (Little -Bent-winged Bat) *Miniopterus orianae oceanensis* (Large Bent-winged Bat)	YES	05/02/2024 - 09/02/2024	4 survey nights	NO	NO
Acoustic Recorder	*Litoria castanea* (Yellow-spotted Tree Frog) *Mixophyes balbus* (Stuttering Frog)	YES	28/10/2024- 25/11/2024	27 survey nights	NO	NO
Call Playback/ Spotlighting	*Litoria castanea* (Yellow-spotted Tree Frog) *Mixophyes balbus* (Stuttering Frog)	YES	05/02/2024- 09/02/2024	~2 person hours 2 people	NO	NO
Pit Fall Traps	*Tympanocryptis mccartneyi* (Bathurst Grassland Earless Dragon).	YES	21/10/2024 – 01/11/2024	10 survey days	NO	NO

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Environment & Design

Author: BH | Version: C A-A3 | Date: 16/01/2025

Figure 5: Field Surveys

Location: Brewongle, NSW
Purpose: Streamlined BDRA
Client: Edify Energy Pty Ltd (Edify) C/O Kleinfelder Australia Pty Ltd
Reference: ER189

Legend

- Study Area
- Proposed Site Access Road
- Subject Land
- Frog Survey
- Bird Census
- Pit Fall Trap
- Anabat
- Koala SAT
- Call Playback
- Threatened Flora Transect October 2024
- Wombat burrow

N

0 100 200 300 400 Meters

Spatial Reference
Datum: GDA2020
Projection: Transverse Mercator
Scale: 1:11,500

4.2 Weather conditions

Weather conditions are known to significantly affect the likelihood of detection of some threatened species. Fauna and flora surveys were conducted at times when weather conditions were neutral, if not optimal for the detection of weather-sensitive species, and in accordance with relevant guidelines and recommendations. Data was obtained from the Bureau of Meteorology (BoM) website, station 063005. **Table 6 – Table 11** detail the timing and environmental conditions of flora and fauna surveys on the Subject Land.

TABLE 6 SPOTLIGHTING

Target SAII species	Date	Temperature (˚C)		Rainfall (mm)	Max wind speed (km/h) (3pm)	Relative humidity (%) (3pm)
		Min.	Max.			
Litoria castanea **(Yellow-spotted Tree Frog)**	05/02/2024	19.8	30	0.8mm	17 km/h	-
Mixophyes balbus **(Stuttering Frog)**	06/02/2024	17.8	26.3	40.2mm	22 km/h	-
	07/02/2024	13.5	24.1	2mm	19 km/h	65
	08/02/2024	14.4	21.1	0mm	20 km/h	66
Incidental non-SAII species						
Petaurus norfolcensis	22/10/2024	-	-	0mm	19 km/h	-
(Squirrel Glider)	23/10/2024	-	25.8	0mm	20 km/h	-
Phascogale tapoatafa	28/10/2024	3.2	-	0mm	30 km/h	26
(Brush-tailed Phascogale)	29/10/2024	-	26	0mm	22 km/h	-

TABLE 7 CALL-PLAYBACK AND SPOTLIGHTING AND ACOUSTIC RECORDER (FROGS)

Target SAII species	Date	Temperature (˚C)		Rainfall (mm)	Max wind speed (km/h) (3pm)	Relative humidity (%) (3pm)	Barometric pressure (hPa)	Cloud cover (oktas)	Moon phase
		Min.	Max.						
Litoria castanea **(Yellow-spotted Tree Frog)**	05/02/2024	19.8	30	0.8	17 km/h	-	1009.3	-	Waning Crescent (33%)
Mixophyes balbus **(Stuttering Frog)**	06/02/2024	17.8	26.3	40.2	22 km/h	-	1009.4	-	Waning Crescent (23%)
	07/02/2024	13.5	24.1	2	19 km/h	65	1017.8	6	Waning Crescent (15%)
	08/02/2024	14.4	21.1	0	20 km/h	66	1022.1	7	Waning Crescent (8%)
Incidental non-SAII species									
Litoria aurea **(Green and Golden Bell Frog)**	05/02/2024	19.8	30	0.8	17 km/h	-	1009.3	-	Waning Crescent (33%)
Litoria castanea **(Yellow-spotted Tree Frog)**	06/02/2024	17.8	26.3	40.2	22 km/h	-	1009.4	-	Waning Crescent (23%)
Litoria booroolongensis **(Booroolong Frog)**	07/02/2024	13.5	24.1	2	19 km/h	65	1017.8	6	Waning Crescent (15%)
Litoria raniformis **(Southern Bell Frog)**	08/02/2024	14.4	21.1	0	20 km/h	66	1022.1	7	Waning Crescent (8%)

Table 8 Bird Surveys

Incidental non-SAII species	Date	Temperature (˚C) Min.	Max.	Rainfall (mm)	Max wind speed (km/h) (3pm)	Relative humidity (%)
Anthochaera phrygia **(Regent Honeyeater)**	22/10/2024	-	-	0	19	-
	23/10/2024	-	25.8	0	20	-
	28/10/2024	3.2	-	0	30	26
	29/10/2024	-	26	0	22	-
Calyptorhynchus lathami lathami **(Glossy Black-Cockatoo)**	05/02/2024	19.8	30	0.8	17 km/h	-
	06/02/2024	17.8	26.3	40.2	22 km/h	-
	07/02/2024	13.5	24.1	2	19 km/h	65
	08/02/2024	14.4	21.1	0	20 km/h	66
Haliaeetus leucogaster **(White Bellied Sea-eagle)**	22/10/2024	-	-	0	19	-
	23/10/2024	-	25.8	0	20	-
	28/10/2024	3.2	-	0	30	26
	29/10/2024	-	26	0	22	-
Lathamus discolor **(Swift Parrot)**	22/10/2024	-	-	0	19	-
	23/10/2024	-	25.8	0	20	-
	28/10/2024	3.2	-	0	30	26
	29/10/2024	-	26	0	22	-

Table 9 Acoustic Recorder

Target SAII species	Type of recorder	Number of recorders deployed	Deployment	Collection	Temperature (˚C) Min.	Max.	Rainfall (mm)	Max wind speed (km/h)	Average Relative humidity (%) (3pm)
Miniopterus australis **(Little - Bent-winged Bat)** ***Miniopterus orianae oceanensis*** **(Large Bent-winged Bat)**	Anabat	1	05/02/2024	09/02/2024	10.6	30.5	44.2	50 km/h	56
Incidental non-SAII species									
Litoria castanea **(Yellow-spotted Tree Frog)** ***Litoria raniformis*** **(Southern Bell Frog)**	Song meter	1	28/10/2024	25/11/2024	3.2	32.8	0	74 km/h	5

Table 10 Spot Assessment Technique (SAT Plots)

Incidental non-SAII species	Start	End	Temperature (˚C) Min.	Temperature (˚C) Max.	Rainfall (mm)	Max wind speed (km/h)	Relative humidity (%) (3pm)
Phascolarctos cinereus **(Koala)**	07/02/2024	07/02/2024	12.8	25	0	35 km/h	65%

Table 11 Threatened Flora Transects (10 metre transect)

Target SAII species	Date	Temperature (˚C) Min.	Temperature (˚C) Max.	Rainfall (mm)	Max wind speed (km/h)	Relative humidity (%) (3pm)
Caladenia attenuata **(Duramana Fingers)**	29/10/2024	3.2	26	0mm	33 km/h	No data
Incidental non-SAII Species						
Eucalyptus aggregata **(Black Gum)**	29/10/2024	3.2	26	0mm	33 km/h	No data
Lepidium hyssopifolium **(Basalt peppercress)**						
Leucochrysum albicans subsp. tricolor						
Swainsona sericea **(Silky Swainson-pea)**						

Table 12 Pitfall traps

Target SAII Species	Date	Temperature (C)(Avg) Min.	Temperature (C)(Avg) Max.	Rainfall (mm)(Avg)	Max wind speed (km/h)	Relative humidity (%) (3pm)
Tympanocryptis mccartneyi **(Bathurst Earless Dragon)**	21/10/20214 – 01/11/2024	5.6	13	0	56 km/h	10

5 Avoid and minimise impacts

This section addresses the requirements in Sections 8.1 and 8.3 of the BAM for assessing the impacts of the proposal on biodiversity values (Chapter 8, BAM 2020).

5.1 Project location and design

The Project design includes a hybrid solar farm and battery energy storage system on the Subject Land. The proposed development is a 90-Megawatt solar farm that will occupy approximately 151 hectares and will be deemed a State Significant Development (SSD). The Subject Land is zoned as RU1 Primary Production and currently managed for agricultural purposes, including grazing and cropping. The Subject Land occupies three lots / part lots (Lot 1 DP1206130, Lot 1 DP1236901, Lot 2 DP1236901). The project site is largely situated within non-native, pasture-improved paddocks, characterised by the absence of large hollow-bearing paddock trees or other significant habitat features. Vegetation primarily comprises of exotic grass species, with limited ecological value for native fauna. These confirmed pasture improved paddock areas are mapped on the NVR map as Cat 1 Lands with the exception a small patch of Category 2- Sensitive Regulated land consisting of a thin band of structural vegetation in the south-western corner of Lot 1 DP1236901 that has been classified as *Southern Tableland Grassy Box Woodland* (PCT 3376). This PCT is associated to the NSW and the Commonwealth Critically Endangered Ecological Community (CEEC) *White Box Blakely's Red Gum Woodland* (**Figure 3** and **Figure 4**).

5.2 Aquatic Ecology – Excluded from this assessment

This streamlined BDAR address terrestrial ecology only and it is not expected to have any significant impact on the adjacent hydrological feature, Salt Water Creek, which is located outside the Subject Land but within the Study Area. However, the Draft Aquatic ecology assessment which contains the impacts associated with aquatic habitats concludes the construction of an access track through Salt Water Creek would directly impact Key Fish Habitat (KFH) at the waterway crossing. Salt Water Creek is expected to have semi-permanent flow, sustained by upstream seeps and potential springs. While waterway crossings can create barriers to fish passage, significant impacts are unlikely, as the vehicle crossing will be designed and built in accordance with the *Policy and Guidelines for Fish Habitat Conservation and Management* (DPI 2013) and *Why Do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings* (Fairfull & Witheridge 2003) (DPM Envirosciences, 2024). Provided that mitigation measures are appropriately considered in the design and construction phases, significant impacts on this feature are unlikely.

5.3 Unavoidable direct and indirect impacts

Despite the avoidance and mitigation measures considered and recommended, some residual impacts will occur under the Project. Up to 151.3 hectares of vegetation will be modified, of which 0.48 hectares has been identified as degraded PCT 3376. The direct and indirect impacts of the Project are summarised along with proposed mitigation measures in **Table 14.**

TABLE 13 RESIDUAL INDIRECT IMPACTS.

Indirect impact (Describe impact, e.g., transport of weeds and pathogens from the site to adjacent vegetation)	**Impacted entities** (PCT/threatened entity and their habitats and where relevant, EPBC Act listing)	**Duration** (long-term/ short-term/ medium-term)	**Project phase/ timing of impact** (e.g., construction, operation, rehabilitation)	**Likelihood and consequences**
Reduced viability of adjacent habitat because of edge effects	All vegetation, all fauna species.	Long-term	Construction and operation	Some loss of viability may occur. The effects would be local and limited to a marginal proportion of habitat in the surrounding area.
Reduced viability of adjacent habitat because of noise, dust and light spill from construction areas	All fauna species.	Short-term	Construction	Likely but limited to areas adjacent to construction activity. Consequences dependent on intensity and duration of activity. Fauna may avoid affected habitat or be less successful there. The area affected is unlikely to be a significant proportion of the local distribution of most species.
Introduction of invasive flora species to the Subject Land	All vegetation, all fauna species.	Long-term	Construction and operation	Possible, however the impacts are likely to be marginal if control measures are in place. The proposed Biodiversity Management Plan (BMP) will reduce the likelihood of the establishment of new invasive flora species and degradation of native vegetation, making infestations easy to identify and control.
Introduction of waste (rubbish, fuels and lubricants, materials) into surrounding ecosystems	All vegetation, all fauna species.	Long-term	Construction and operation	Possible, if effective materials storage and waste management systems are not implemented. Consequences may include harm to fauna through ingestion or exposure to rubbish, contamination of soil and waterways etc.
Increased risk of starvation, exposure and loss of shade or shelter	All fauna species.	Long-term	Construction and operation	Possible, however the impact on most species is likely to be marginal given the abundance of similar habitat in the surrounding landscape. Less mobile species with smaller ranges may experience greater local competition for these resources.
Loss of breeding habitats (stick nests and HBTs)	All fauna species.	Long-term	Construction and operation	Very unlikely due to no HBT's being recorded in the locality and impact on hollow-dependent species is directly proportional to the number of hollows removed. As with the increased risks of exposure, starvation etc., most species will not be significantly

Indirect impact (Describe impact, e.g., transport of weeds and pathogens from the site to adjacent vegetation)	**Impacted entities** (PCT/threatened entity and their habitats and where relevant, EPBC Act listing)	**Duration** (long-term/ short-term/ medium-term)	**Project phase/ timing of impact** (e.g., construction, operation, rehabilitation)	**Likelihood and consequences**
				impacted because of the abundance of similar habitat available nearby.
Hydrological changes	All vegetation.	Long-term	Construction and operation	Very unlikely. Any effects likely to be limited to the area of direct impacts. Effects on groundwater are unlikely.
Increase in predatory species populations	All fauna species.	Long-term	Construction and operation	Possible, although the Project does not include any activities likely to directly promote predator population growth. The presence of waste and disturbance may attract feral predator species (e.g., foxes)
Increase in pest animal populations	All fauna species.	Long-term	Construction and operation	Possible, although the Project does not include any activities likely to directly promote pest population growth. Some species may benefit from disturbance caused by Project activities.
Fertiliser or herbicide drift	All vegetation	Short-term	Construction	Possible. Herbicide drift could kill or sicken native vegetation in areas adjacent to treated sites. Best practice herbicide application minimises the risk of drift by avoiding spraying when drift is likely to cause harm.

5.4 Prescribed impacts

Prescribed impacts are impacts on threatened species which are not accounted for during assessment of native vegetation disturbance impacts within the BAM-C. They include impacts to:

- Karst, caves, crevices, cliffs, rocks and other geological features of significance
- Human-made structures or non-native vegetation
- Habitat connectivity
- Water bodies, water quality and hydrological processes
- Wind turbine strikes
- Vehicle strikes

No prescribed impacts are anticipated to occur as part of the Project. No predicted or candidate species were detected on the Subject Land and the habitat is unlikely to be preferred by any threatened species within the locality. The habitat present is poor and fragmented in its extent, consequently, the loss of potential foraging use by vagrant threatened species is unlikely to have a significant impact. Furthermore, the Project is not expected to result in significant impacts from vehicle strikes to fauna, as mitigation measures, including speed limits and driver awareness protocols, will be implemented to minimise risks. While there will be a short-term increase in vehicle movements during construction, these measures will ensure that potential impacts are limited and temporary (**Table 14**).

5.5 Mitigation Measures

Some impacts could not be avoided or minimised by the Project design and must be mitigated instead. These include standard construction impacts and those specific to the Project. These are outlined in **Table 9**.

TABLE 14 IMPACT MITIGATION MEASURES

Mitigation measure	Method/technique	Timing	Frequency	Responsibility
Speed limits	Speed limits maintained and enforced for Project traffic.	Construction, post-construction	N/A	Construction contractor
Weed management	The Arrive Clean, Leave Clean guidelines should be adhered to.	Construction	As required	Construction contractor
Pathogen risk management	During the clearing activities and the construction of the Proposed Development, plant and machinery will be cleaned of any foreign soil and propagative material prior to being transported to the construction areas to prevent the spread of weeds.	Construction	As required	Construction contractor
Weed management	Weed management procedures will be implemented to prevent the spread of weeds both inside and outside the site.	Construction, post-construction	As required	Construction contractor

Mitigation measure	Method/technique	Timing	Frequency	Responsibility
	Ongoing weed monitoring is to be implemented, and potential weed infestations appropriately managed to minimise the spread of weeds.	Construction, post-construction	As required	Construction contractor
Worker induction and training	If machinery is transported from an area of confirmed infection of Phytophthora or Chytrid fungus to the construction areas, stringent wash down will be completed before leaving the area, removing all soil and vegetative material from cabins, trays, and under carriages.	Construction	As required	Construction contractor
Delineation of disturbance areas	During construction, the Modification Disturbance Area will be delineated to ensure clearing is not undertaken outside of these areas.	Construction	As required	Construction contractor
Construction and work hour limits	Hours of construction would be restricted to reduce overall noise, dust, light spill etc.	Construction	N/A	Construction contractor
Erosion and sediment control	Erosion and sediment control will be implemented and maintained during Project construction and operation	Construction	As required	Construction contractor

6 Impact summary

6.1 Impacts on native vegetation and Threatened Ecological Communities

The total area of PCT 3376 to be cleared is 0.48 hectare within the Subject Land. This PCT is considered to commensurate with the BC Act listed community *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions*. However, this PCT is not considered to commensurate with the EPBC Act listed community, *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* because it does not reach the minimum patch size and condition class thresholds.

As the Project will involve the complete removal of all vegetation within the Project footprint, changes to the vegetation integrity are represented by the reduction of all VI components and scores to 0 (Error! Reference source not found.).

TABLE 15 CHANGES TO VEGETATION INTEGRITY

Vegetation zone	PCT ID	Management zone	Area (ha)	Before development				After development				Change in VI score
				Comp.	Struc.	Func.	VI score	Comp.	Struc.	Func.	VI score	
3376_low	3376	1	0.48	3.3	3.1	29.7	6.7	0	0	0	0	-6.7

6.2 Impacts on threatened species.

No threatened species or important habitat were identified within the Study Area. While individuals of some threatened species may occasionally visit the area, the marginal scale and quality of habitat available make its loss unlikely to affect them. No significant impacts are considered likely to occur as a result of the proposed development.

6.3 Biodiversity credit report and offsets

The VIS is 6.7 which is well below the VIS of greater than fifteen (15) required for the TEC associated with PCT 3376. Consequently, the Project does not require any ecosystem credit offset obligations. The biodiversity credit report, which provides further details about the lack of offset requirements is located in **Appendix E**.

6.4 Limitations

The limitations and assumptions applying to this assessment include:

- All calculations of direct impacts assume clearing of vegetation to the maximum extent of the proposed Project footprint indicated in Error! Reference source not found..
- The likelihood of indirect and prescribed impacts can generally be estimated with reasonable accuracy, however, their magnitude and consequences for any individual species or ecosystem can rarely be reliably quantified, even where specialist information (e.g., noise assessments, hydrological studies) is available for the potential impacts.

7 Conclusion

The project will involve modifying up to 151.3 hectares of vegetation, including 0.48 hectares of PCT 3376 which forms part of the BC Act-listed TEC, *White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions*. However, it is not considered to be commensurate with the equivalent EPBC Act listing because its patch size and condition are below the relevant thresholds. Its condition (VIS = 6.7) is well below the threshold requiring offsets (≥ 15 for EECs), consequently, there is no ecosystem credit offset liability required.

No threatened species were recorded by targeted surveys within the Project boundary. There is no species credit liability for the Project either.

The recommended mitigation measures will manage identified marginal impacts to native biodiversity on the subject and adjacent land.

8 References

DPIE (2020). Biodiversity Assessment Method 2020. Available at: https://www.environment.nsw.gov.au/research-and-publications/publications-search/biodiversity-assessment-method-2020.

DPIE (2020). Biodiversity Assessment Method 2020 Operational Manual – Stage 1. Available at: https://www.environment.nsw.gov.au/research-and-publications/publications-search/biodiversity-assessment-manual-2020-operational-manual-stage-1.

DPIE (2019). Biodiversity Assessment Method 2020 Operational Manual – Stage 2. Available at: https://www.environment.nsw.gov.au/research-and-publications/publications-search/biodiversity-assessment-method-operational-manual-stage-2.

DPM Enviroscіences (2024). *Draft Aqautic Ecology Assessment - Brewongle Solar Farm*.

NSW EES (2023). Threatened biodiversity profile search. Available at: http://www.environment.nsw.gov.au/threatenedSpeciesApp/. Accessed 8 Mar. 2023.

Office of Environment and Heritage [OEH] (2023). Biodiversity Values Map – extract for the project area. (Accessed January 2024) https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BOSETMap

OEH (2023). NSW BioNet. Available at: http://www.environment.nsw.gov.au/atlaspublicapp/UI_Modules/ATLAS_/AtlasSearch.aspx. Accessed 8 Mar. 2023.

OEH (n.d.).BioNet Vegetation Classification. Available at: https://www.environment.nsw.gov.au/NSWVCA20PRapp/default.aspx. Accessed 8 Mar. 2023.

APPENDIX A – S-BDAR CONTENT REQUIREMENTS (SMALL AREA)

TABLE A 1 STEPS TO ASSESS SMALL AREAS

BAM chapter	BAM Section	Streamlined assessment requirement	Page reference(s) in the SBDAR
Chapter 3: Establishing the site context	3.1	Identify the IBRA subregion in which the development takes place.	**Table 1**
		Identify any relevant landscape features listed in Section 3.1.	**Table 1**
	1 and 4.3	The assessor must assess the site context, in accordance with Section 3.2 and Subsection 4.3.2: a. native vegetation cover b. patch size.	**Section 3** **Section 3.3**
Chapter 4: Assessing native vegetation, threatened ecological communities and vegetation integrity	4.1	Prepare a map of native vegetation for the Subject Land as per Section 4.1.	**Figure 3**
	4.2	Identify the dominant PCT on the Subject Land either by: a. use of existing information, or b. collection of plot-based survey data as required by Box 1 and choosing the PCT based on analysis of the plot data. Identify if the PCT is associated with a threatened ecological community (TEC) as required by Subsection 4.2.2. Where a TEC is identified on a site that is not associated with the dominant PCT, that TEC is required to be assessed and offset accordingly. In this situation more than one PCT may be selected for assessment.	**Section 1.2** **Section 3.1** **Section 3.1**
	4.3.3	Assess the vegetation integrity of the PCT(s) on the Subject Land as individual vegetation zones either: a. qualitatively by observing values for the condition attributes set out in Table 2 (justification must be included as to how these values were determined), or b. quantitatively by collecting field data for the condition attributes at a plot in accordance with Subsection 4.3.4.	**Section 3.4**
	4.4	Determine the vegetation integrity score in accordance with Section 4.4, using Equations 16–24 in Appendix H, by entering observed values or plot data into the small area module of the BAM-C.	**Section 3.4**
Chapter 5: Assessing the habitat suitability for threatened species	5.2	Determine the suite of threatened species likely to occur on or use the development site according to Step 1 and Step 2 in Section 5.2. This includes the predicted species assessed for ecosystem credits and the candidate species assessed for species credits.	**Section 4**

BAM chapter	BAM Section	Streamlined assessment requirement	Page reference(s) in the SBDAR
		All of the candidate species credit species identified for the proposal according to Step 1 and Step 2 that are at risk of an SAII must be further assessed in accordance with Steps 3–5 in Section 5.2. Candidate species credit species that are not at risk of an SAII and are not incidentally recorded on the Subject Land do not require further assessment.	
	5.3	Survey (or an expert report) of species credit species that are at risk of an SAII must be undertaken in accordance with Section 5.3. The assessor must prepare a species polygon for each candidate threatened species that is recorded on the Subject Land. Where a threatened species is identified on the Subject Land that is not at risk of an SAII (i.e. incidentally observed during site visit) the species must be recorded, and the assessor must prepare a species polygon.	**Section 4.1** **Figure 5**
Chapter 7: Avoiding or minimising impacts on biodiversity values	7.1 and 0	Address how the proposal has been located to avoid and minimise any impact on native vegetation and threatened species habitat including locating and designing the proposal. Record any measures that are proposed to be taken to minimise direct and indirect impacts.	**Section 5**
Chapter 8: Assessing the impacts of the proposal on biodiversity values	8.1 and 8.3	Complete Subsection 8.1.1 to determine the impact of the development on vegetation integrity and threatened species habitat. Assess all direct and indirect impacts on biodiversity values, including any prescribed impacts.	**Table 12**
Chapter 9: Thresholds for assessing and offsetting the impacts of development	9.1	The assessor must address the impact assessment requirements set out in Subsection 9.1.1 for TECs and Subsection 9.1.2 for threatened species or populations that are at risk of an SAII for the proposed development.	**Section 6.1** **Section 6.2**
Chapter 10: Applying the no net loss standard	9	Calculate the number of ecosystem credits required for impacts on biodiversity values according to Subsection 9.	**Section 6.3**
	10.1.3 (only required when Section 5.3 is completed)	Calculate the number of species credits required for impacts on biodiversity values according to Subsection 10.1.3. This includes any species credit species that has been incidentally observed on the Subject Land. Note that the species credits for any species at risk of an SAII are calculated in the event that the decision-maker forms the opinion that the proposed impact is **unlikely** to be serious and irreversible and therefore can be offset.	**Section 6.3**
	10.2	Identify the credit class for ecosystem credits and species credits according to Section 10.2 (this report can be generated from the BAM-C).	**Section 6.3**

APPENDIX B – VEGETATION SURVEY DATA

TABLE B116 BAM PLOT HABITAT FUNCTION ASSESSMENT

	Plot location					Coordinates			Composition							Structure					Function				Stem class size						High
Plot	PCT	Area (ha)	Patch size (ha)	Condition class	Zone	Easting	Northing	Bearing	Tree	Shrub	Grass	Forbs	Ferns	Other	Tree	Shrub	Grass	Forbs	Ferns	Other	Large Trees (80cm+)	Hollow trees	Litter Cover (Avg)	Fallen Logs	5 to 9	10 to 19	20 to 29	30 to 49	50 to 79	Tree Regen	Threat Exotic
Plots within the Subject Land																															
BHTS1	3376	0.48	>100	Low	55	149.682393	-33.467147	184	1	1	0	2	0	0	2	2	-	0.7	0	0	0	0	7	4.0	1	1	1	0	0	1	0
Plots outside the Subject Land																															
BHTS3	3376	0.0147	>100	Low	55	149.692722	-33.473508	117	1	0	4	2	0	9	0	5	2.525	0.06	0	0	0	0	8	1.5	1	0	0	1	0	0	0
BHTS2	0	0	<100	Non-Native	55	149.682696	-33.467209	104	0	1	2	3	0	0	0	0.1	0.53	0.03	0	0	0	0	10	0	0	0	0	0	0	0	0
BHTS4	0	0	<100	Non-Native	55	149.698117	-33.473423	237	0	0	5	3	0	0	0	0	17.2	1.02	0	0	0	0	1	0	0	0	0	0	0	0	0

TABLE B2 17 FLORISTICS COVER AND ABUNDANCE DATA

Family	Scientific Name	Common Name	Form	BAM Plot ID							
				BHTS1		BHTS2		BHTS3		BHTS4	
				C	A	C	A	C	A	C	A
Fabaceae (Mimosoideae)	*Acacia parvipinnula*	Silver-stemmed Wattle	Shrub (SG)	2	1						
Amaranthaceae	*Amaranthus sp.*	-	Forb (FG)	0.5	10						
Amaranthaceae	*Amaranthus viridis*	Green Amarantha	Forb (FG)			0.01	2	0.05	100	0.01	1
Chenopodiaceae	*Atriplex patula*	-	Exotic	0.01	1						
Poaceae	*Austrostipa scabra*	Speargrass	Grass & grasslike (GG)							0.01	1
Brassicaceae	*Brassica x napus*	Rape	Exotic	0.2	3	0.5	5	0.01	1		
Poaceae	*Bromus catharticus*	Praire Grass	Exotic	50	2000			30	500		
Asteraceae	*Centaurea solstitialis*	St Barnabys Thistle	Exotic			1	10				
Asteraceae	*Centaurea calcitrapa*	Star Thistle	Forb (FG)							1	3
Chenopodiaceae	*Chenopodium album*	Fat Hen	Exotic	0.5	10						
Poaceae	*Chloris truncata*	Windmill Grass	Grass & grasslike (GG)			0.03	3				
Asteraceae	*Cichorium intybus*	Chicory	Exotic			10	50				
Asteraceae	*Cirsium vulgare*	Spear Thistle	Exotic					0.02	2		
Poaceae	*Cynodon dactylon*	Common Couch	Grass & grasslike (GG)					0.01	1		
Poaceae	*Dactylis glomerata*	Cocksfoot	Exotic					0.01	2	0.5	100
Poaceae	*Digitaria eriantha*	Finger Panic Grass	Exotic			5	50				
Chenopodiaceae	*Dysphania ambrosioides*	Mexican Tea	Shrub (SG)			0.01	2				
Chenopodiaceae	*Dysphania carinata*	Keeled Goosefoot	Exotic					0.05	15	0.05	5
Boraginaceae	*Echium plantagineum*	Patterson's Curse	Exotic							0.05	3
Poaceae	*Eleusine indica*	Crowsfoot Grass	Exotic			0.5	5				
Poaceae	*Eleusine tristachya*	Goose Grass	Exotic					0.05	5	0.5	100
Poaceae	*Eragrostis cilianensis*	Stinkgrass	Exotic			5	500				
Poaceae	*Eragrostis elongata*	Clustered Lovegrass	Grass & grasslike (GG)							0.01	1

Family	Scientific Name	Common Name	Form	BAM Plot ID							
				BHTS1		BHTS2		BHTS3		BHTS4	
				C	A	C	A	C	A	C	A
Poaceae	*Eragrostis leptostachya*	Paddock Lovegrass	Grass & grasslike (GG)					2	100	1	100
Poaceae	*Eragrostis parviflora*	Weeping Lovegrass	Grass & grasslike (GG)			0.5	5				
Myrtaceae	*Eucalyptus blakelyi*	Blakely's Red Gum	Tree (TG)	2	3			5	1		
Juncaceae	*Juncus continuus*	-	Grass & grasslike (GG)							1	7
Brassicaceae	*Lepidium spp.*	-	Forb (FG)			0.01	1				
Solanaceae	*Lycium ferocissimum*	African Boxthorn	HTW - Manageable	0.5	1						
Fabaceae (Faboideae)	*Medicago sativa*	Lucerne	Exotic			90	200				
Fabaceae (Faboideae)	*Medicago spp.*	-	Exotic							0.01	1
Poaceae	*Phalaris aquatica*	Phalaris	Exotic	90	5000	0.1	1	85	2000	10	1000
Plantaginaceae	*Plantago lanceolata*	Lamb's Tongues	Exotic					0.05	2	1	20
Polygonaceae	*Rumex acetosella*	Sorrel	Grass & grasslike (GG)					0.5	50		
Polygonaceae	*Rumex brownii*	Swamp Dock	Forb (FG)	0.2	5	0.01	1	0.01	1	0.01	1
Poaceae	*Rytidosperma fulvum*	Wallaby Grass	Grass & grasslike (GG)							15	2000
Poaceae	*Rytidosperma spp.*	-	Grass & grasslike (GG)					0.01	1		
Asteraceae	*Senecio madagascariensis*	Fireweed	Exotic	0.2	3			0.02	2	0.05	3
Asteraceae	*Tragopogon dubius*	Goatsbeard	Exotic	0.5	5						
Zygophyllaceae	*Tribulus terrestris*	Cat-head	Exotic			0.5	15				

Note: C = Percentage Cover, A = Abundance

APPENDIX C - DETAILED PCT DESCRIPTION

PCT ID	3376	Representative PCT Photo
PCT name	*Southern Tableland Grassy Box Woodland*	
Vegetation formation	Grassy Woodlands	
Vegetation class	Southern Tableland Grassy Woodlands;	
Per cent cleared value (%)	92.96%	
Associated TECs	*White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions.* *White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland.*	
Extent within Subject Land (ha)	TOTAL: 0.48 ha	
Key diagnostic species	**Upper Stratum Species**: *Eucalyptus blakelyi* **Mid Stratum Species**: No diagnostic mid stratum species present **Ground Stratum Species**: *Chloris truncata*	
Alternative PCTs considered	• PCT 3366 – **Eliminated due to the upper stratum species not aligning with the BioNet VIS PCT description.** This PCT requires a frequent occurrence of *Eucalyptus viminalis* and *Eucalyptus bridgesiana*. • PCT 3369 - **Eliminated due to vegetation description not aligning with the BioNet VIS PCT description.** This PCT is described as a moist grassy sclerophyll forest found on sheltered slopes. With a canopy frequently containing *Eucalyptus dives* and *Eucalyptus darlympleana.* • PCT 3387 - **Eliminated due to vegetation description not aligning with the BioNet VIS PCT description.**	

PCT ID	3376	Representative PCT Photo
	This PCT is described as occurring on along intermittent drainage lines in gentle valley floors.	
Justification	The site was determined to support **PCT 3376** based on the presence of characteristic species identified in the upper and ground strata, as outlined above. These species were confirmed on-site through vegetation validation mapping, which incorporated Rapid Data Points (RDPs) and BAM plot floristic data. The data was then input into the BioNet Vegetation Classification Excel PCT Description Tool, along with relevant attributes such as IBRA region, IBRA subregion, Mitchell landscape, vegetation formation, and LGA, to filter PCTs consistent with the site's location. This process identified **PCT 3376** as the only viable match. However, given the degraded condition of the site, additional PCTs were considered without applying ground stratum species filters. This broader analysis identified **PCT 3366**, **PCT 3369**, **PCT 3376**, and **PCT 3387** as potential matches. Upon further review: • **PCT 3387** and **PCT 3369** were excluded due to their BioNet VIS PCT location descriptions not aligning with the site locality. • **PCT 3366** was excluded based on the lack of alignment between upper stratum species and those identified on-site. The final selection of **PCT 3376** was further supported by its proximity to mapped occurrences of this PCT in the NSW State Vegetation Type Map (SVTM).	
Vegetation zones	3376_low	

APPENDIX D – THREATENED ECOLOGICAL COMMUNITY JUSTIFICATION

PCT ID	PCT Name	Vegetation Zone ID	Condition	EPBC Act TEC Name	EPBC Act listing	BC Act TEC Name	BC Act Listing	Justifications
3376	*Southern Tableland Grassy Box Woodland*	3376_low	Low	*White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland*	CE	*White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions*	CE	**BC Act - Location and physical environment:** The IBRA bioregion is the South Eastern Highlands where the CE is known to occur **Structure and composition:** To align a vegetation patch with the TEC, floristic assemblages and occurrences within the patch is a key consideration. In this case, the present of *Eucalyptus blakelyi*, (**Table B2**) which is a defining characteristic of the community has aligned the patch to the TEC. The presence of this species alone is considered sufficient to meet the species assemblage requirements for aligning the vegetation patch with the TEC, as outlined in the final determination. **EPBC Act – Location and physical environment:** The IBRA bioregion is the South Eastern Highlands where the CE is known to occur **Structure and composition:** The final determination for this community outlines several parameters required to align the TEC with a vegetation patch. However, the floristic assemblages do not meet these parameters, particularly the requirement for a predominantly native understorey, which is absent in the area, as identified in **Table B2**. Consequently, the patch is not characteristic of the community.

APPENDIX E - BIODIVERSITY CREDIT REPORT

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id
00053619/BAAS17065/24/00053623

Proposal Name
ER189 Brewongle Solar Farm S-BDAR

BAM data last updated *
28/10/2024

Assessor Name
Arne Henry Bishop

Assessor Number
BAAS17065

BAM Data version *
Current classification (live - default) (80)

Proponent Names

Report Created
17/04/2025

BAM Case Status
Finalised

Assessment Revision
0

BOS entry trigger
BOS Threshold: Area clearing threshold

Assessment Type
Part 4 Developments (Small Area)

Date Finalised
17/04/2025

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	Critically Endangered Ecological Community	3376-Southern Tableland Grassy Box Woodland

NSW GOVERNMENT

BAM Biodiversity Credit Report (Like for like)

Species
Nil

Additional Information for Approval

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
Botaurus poiciloptilus / Australasian Bittern
Calyptorhynchus lathami lathami / South-eastern Glossy Black-Cockatoo

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

BAM Biodiversity Credit Report (Like for like)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
3376-Southern Tableland Grassy Box Woodland	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	0.5	0	0	0

3376-Southern Tableland Grassy Box Woodland

Like-for-like credit retirement options

Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla This includes PCT's: 74, 75, 83, 250, 266, 267, 268, 270, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 286, 298, 302, 312, 341, 342, 347,	-	3376_Low	No	0	Bathurst, Burragorang, Hill End, Kanangra, Oberon, Orange and Wollemi. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

NSW GOVERNMENT

BAM Biodiversity Credit Report (Like for like)

	350, 352, 356, 367, 381, 382, 395, 401, 403, 421, 433, 434, 435, 436, 437, 451, 483, 484, 488, 492, 496, 508, 509, 510, 511, 516, 528, 538, 544, 563, 567, 571, 589, 590, 597, 599, 618, 619, 622, 633, 654, 702, 703, 704, 705, 710, 711, 796, 797, 799, 847, 851, 921, 1099, 1303, 1304, 1307, 1324, 1329, 1330, 1332, 1383, 1606, 1608, 1611, 1691, 1693, 1695, 1698, 3314, 3359, 3363, 3373, 3376, 3387, 3388, 3394, 3395, 3396, 3397, 3398, 3399, 3406, 3415, 3533, 4147, 4149, 4150					

Species Credit Summary

No Species Credit Data

Credit Retirement Options

Like-for-like credit retirement options